

Open SMC

Open Salzburg Mathematics Colloquium

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A dynamic discounting model for the dispersion and redistribution of pollutants emitted from point sources in air, surface, subsurface and groundwater

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Abstract:

We propose a space-time dynamic model for the determination of pollutant concentrations in air, surface, subsurface and groundwater. It is assumed that the pollutant is emitted into the air from one or several point sources, and then transported via wind and rain to the soil surface, subsurface and groundwater. Also groundwater pollution is modelled space-time dynamically, taking into account subsurface flow. Moreover the model includes soil parameters like water-saturation, type, etc....

This model can be formulated as a complex multidimensional stochastic difference equation in space-time. One may think of the model as a kind of interest rate model, where a during time always increasing amount of money (the pollutant) is discounted through 4 levels with different interest rates (air, surface, subsurface, groundwater) and where the money may be redistributed at certain rates also to different „similar“ banks (the spatial locations in air, surfaces, subsurface, groundwater). As an illustrative example serve data from HCB (Hexachlorbenzene) pollution in the Görtschitztal, Carinthia, Austria, where a lot of HCB has been emitted during approx. 2 years from one cement plant, likely due to wrong processing and too low process temperature.

15:00-16:00
HS 414, 1. Stock

Open SMC richtet sich an alle an Mathematik und Statistik Interessierten, insbesondere an Studierende.